# Ammo Can BlueTooth Boom Box

There are quite a few indestructibles already about this project but I figured I would add my 2 cents here and include mine. Perhaps some motivation for other members that may be on the fence to pull the trigger and build something similar!

I needed a boom box for the garage since I spend so much time there working on projects. I'm sure I could of purchased a product similar (4" speakers, power output, etc.) for less than I spent on this but hey, I'm a maker and would rather have something I built that works over something store bought any day.

So I read all the other indestructible and decided what features I wanted:

Container would be an ammo can, Support for Bluetooth or audio cord, ability to charge a phone, be rechargeable without opening the box up, could run on battery for a couple of hours.

Some of the earlier indestructibles the Bluetooth support was difficult, now you can buy a cheap amp with blue tooth support built in.

## Step 1: The parts & tools used

Usually I have some part of the materials for my instructables laying around,this time I didn't. Here's the parts and tools I used for this project.

**Parts**

Ammo box - $30

Nobsound® TPA3116 Bluetooth 4.0 Audio Receiver HiFi Stereo Amp Amplifier Board 50W×2 $40
https://www.amazon.com/gp/product/B016ZR7JZK/ref=...

2) New Kicker 40CS44 4" 150W 2 Way Car Coaxial Speakers Stereo Audio CS44 PAIR $50
https://www.amazon.com/gp/product/B00BGRMEUK/ref=...

UPG UB1250 12V 5AH SLA BATTERY COMBO WITH CHARGER $19
https://www.amazon.com/gp/product/B00BSENQHQ/ref=...

USB and 2RCA to USB & 3.5mm Female Flush Mount #13
https://www.amazon.com/gp/product/B00VT477N4/ref=...

STDP switch - laying around

Waterproof switch cover - $3

AC flush mount plug - $4

Inline Fuse holder - $3

Pack of Fuses - $3

Re-purposed 12v car charger - free

Misc nuts and bolts - laying around

Misc wire, wire connectors, screw terminal and shrink tubing - laying around

**Tools**

Drill, misc drill bits, Jig saw, 1/2 round file, square file, 1" hole saw + arbor, ruler, square, pencil, felt pin

**Notes**

Ok so these are the parts I chose for this. YMMV. I was already bleeding money on this project that's why I went with a SLA (sealed lead acid) battery. Heavy but it has the best $ to Ah ratio you are going to find and it came with a charger. I spec'ed out a 18V LiPo and a Nimh solution but the battery cost ($60-$80 less the charger) wasn't worth it for me.

For the USB and audio jack, I really liked how both of these were self contained in a single plug and included the cables. Save me a lot of time trying to drill and file a hole for the USB. And l liked the look of it on the side of the box :-) I just plugged the RCA jacks right into the amp and the USB cable from the connector plugged right into the 12v car charger!

I re-purposed a 12v USB car charger. Sorry I didn't include the details in this build but there are quite a few examples on this site on how to do this. It's very straight forward.

## Step 2: Layout and Design & the Amp

Ok so I'm no audio-phile, no idea on what speakers are best or what all the numbers related to the amp and speakers really mean. I picked them by price and reviews on Amazon.

**The Amp**

***Mounting the AMP - NOTE HERE -***

***NOTE HERE -***

I picked the amp on features and reviews on Amazon - all pretty good. What I didn't pay attention to was ***how it was going to be mounted in the box***. Turns out I had to remove a LED and a power switch, the board has no mounting holes on the PC board and the knobs are kinda close together. If I would of thought this through I probably would of purchased another amp.

**Using the AMP**

So this amp will run on a voltage anywhere from 12v to 20v. It was listed as 12v to 18V on Amazon but I contacted the seller (Quick response from them BTW) and they told me it could run all the way up to 20v.

When I first wired it up - with a spare 12v plug in the wall power supply laying around, plugged it into the amp. I soldered the wires that came with the speakers to the board, connected and gave it a try. It sounded like crap. It turns out the power supply would only output 1 AMP and that was way to small for the job. I found another 12v 2Amp plug in the wall power supply and tried again - MUCH better!. So then I tried a 20v 2.5 Amp Lenovo laptop charger and it sounded AMAZING! I could max out the volume on the phone and on the pots on the amp and it would distort only on some heavy bass.

But, then I tried to work out a battery/charger solution for a 18-20V 5Ah-ish battery solution - not so good. With the charger and batteries it was going to be over $100. So I decided to go with the 12V 5Ah SLA batter and charger (less than 20 bucks for both)

**Layout**

So I pre-fitted everything and determined where I need to drill my holes. Measure twice, cut once you know. I didn't want any extra holes in the box because I didn't think things through.

To cut the speaker holes, I pre-drilled some 1/2 holes around the diameter then went to town with the jig-saw. Again being careful to stay within the lines. Same thing for the 120v plug. For the 1" plug for the USB and audio jack the plug required a 1" hole saw. I had almost every size laying around but this one. So it was a extra $9 bucks for the hole saw.

## Step 3: Wire it!

So after all the holes were cut I started to figure out my wiring.

- I knew I wanted a fuse between the battery positive and everything else.

- I wanted every connection shrink wrapped

- I knew that the battery positive needed to connect to the output of the 12v charger, one side of the power plug to the amp and a connection to the battery charger - 3 connections total

- For the Negative off the battery - same thing - 3 connections

- I needed the power from the battery to go through a switch first -

- I needed the AC to go directly to the charger. I actually soldered the wires directly to the plug in the wall power supply and made sure to completely shrink wrap the connections same for the outputs of the 120v input. I double sided taped the 12v battery charger to the bottom of the box. I wanted to avoid any exposed 120v connections in the box.

- The plug with the USB and audio input both had cables - the USB connected directly to the car charger and the RCA cables from the audio jack connected directly to the AMP (this made things soooo much easier)

- I used a connection block double sided taped to the top of the battery to manage all of the connections to the positive and negative to the battery. That was taped over once the wiring was complete.

For the car charger, I removed the original connections on the board, replaced them with wires and then completely taped the whole charger up because it's not mounted to anything in the box.

To keep the battery from moving, I cut some thin gauge sheet steel to make a strap around the battery and another bent at 90 deg with some foam padding to keep the battery down. All were bolted to the box. I also added some foam padding on the bottom of the battery so that it would lay flat at the bottom of the box. (The bottom of the box - my box anyway wasn't flat. It had about a 1/4 raised area in the center. I can turn the box upside down and nothing moves in it!

To mount the AMP i used the three (volume, bass, treble) pots to mount it to the side of the box but this wasn't sufficient. I also added a standoff from the side of the box with some 1/2 flat nylon washers on it and tie wrapped it to a convenient part of the PC board. Not perfect

but given that there was no room on the board to drill any mounting holes this was as good as it got.

## Step 4: Finish & Test

I have to say overall I'm very happy with the way this one turned out! Only a few evenings of work once all the parts where obtained to put it together.

I've included two videos, For the first one I wanted to see how much current this thing would pull when maxed out. Using my Astroflight inline voltage/current/time meter and a tune with lots of drums I was able to see about two amps at a peak and around 1.7 amps with everything maxed out - volume on phone, and the three controls maxed out. There was also some distortion with it cranked that high so the box won't see that value during actually use.

So running at a 'regular' volume I'm seeing less than 1/2 an amp-ish. With a 5 Ah battery that's like 10 hours of run time - which cost < 20 bucks - so all good.

The 2nd video is during power up. Since my phone already knows about the Bluetooth, just turning the box on I end up connecting. The amp itself doesn't require any Bluetooth password - which is also nice.